IPOMOEA ASARIFOLIA (CONVOLVULACEAE), ANOTHER POTENTIAL EXOTIC PEST IN THE UNITED STATES

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Known in Brazil as "salsa," *Ipomoea asarifolia* (Desr.) Roem. & Schult. is currently distributed in both the New and Old World but is of uncertain origin; recent research suggests Asia as the most likely native region (Austin, unpubl. data). In 1994, a population of this species was discovered in Broward County, Florida, the first known occurrence in the United States. Based on herbarium specimens collected at the time and identified by the second author, the species was subsequently recorded by Wunderlin (1998). In this note, we wish to formally report details of the discovery and provide additional information on the species' characters and habits, which have raised concerns about its potential as a pest plant in this country.

Following up on a report to the first author from a wetlands botanist inspecting a delineation project, aquatic regional biologist Jackie (Jordan) Smith investigated in October 1994 a suspected population of *Ipomoea aquatica* Forssk., a prohibited species in Florida (Florida Administrative Code, DEP 62C-52). Though the suspect vine was found growing across the surface of a pond, as *I. aquatica* commonly grows, it was not that species and did not match any other *Ipomoea* known for Florida. A small sample was identified in November 1994 by the second author as a species new to the United States. In August 1996, the site, located along a canal maintained by the South Broward Drainage District (SBDD), was revisited, and fresh flowering specimens were collected for verification. The vine was well-established around and in a small pond at a pasture edge and clambered up adjacent shrubs (*Myrica cerifera* L.); it also appeared to have spread farther by runners among the mowed grasses down and along the canal bank.

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The site has been dramatically altered since 1996 by urban development activities. By June 1999, much of the SBDD Canal No. 5 had been filled in and paved over with the opening of the divided, four-laned Dykes Road. A large residential subdivision, Silver Shores, occupies much of the former pastureland just north of the earlier-visited small pond, a remnant of which still exists in the remaining low, wet area, which itself is slated for residential development and has experienced some preliminary bulldozer work. The *I. asarifolia* survived this massive disturbance; in fact, the population has spread considerably along the new roadway and away from the pond area, creeping across bare lime rock, floating across shallow pools of water, and clambering over native and exotic herbs and shrubs. The population extends about 800 m along Dykes Road and as far as 300 m westward from it, between Silver Shores and Miramar Parkway. It does not appear to have been carried east of Dykes Road or south of Miramar Parkway, areas also undergoing considerable earth-moving activity.

Voucher specimens: U.S.A. **FLORIDA. Broward Co.:** W side right-of-way, SBDD Canal No. 5, just NW of I-75 and Miramar Parkway interchange, within Miramar city limits, in mowed area and around small adjacent pond, on sandy soil, 17 Oct 1994, *Jackie Jordan s.n.* (FAU, FSU); 21 August 1996, *Burks 1074* (FAU, FLAS, FSU, USF); along W side of Dykes Rd., in disturbed wet ground, thin muck or sand over limestone or bare limestone, to 300 m W of roadside, between southern boundary of Silver Shores subdivision and jct. of Dykes Rd. and Miramar Parkway, just NW of I-75 and Miramar Parkway interchange, within Miramar city limits, SE 1/4 of NE 1/4 Sec 29, T51S R40E, Lat. 25° 59.158' N, Long. 80° 21.669' W, 25 Jun 1999, *Burks 1159* (FAU, FLAS, FSU, USF).

A vector for this introduction is unknown, but the possibilities are numerous. The site has a long history of disturbance: cattle pasture, canal bank, roadside, housing development; the stand first noted in 1994 may have been overlooked for some time. Seed or stem fragments could have arrived on farm or canal-maintenance equipment; as a contaminant in feed, straw, or grass seed; or in the gut of imported cattle (or migratory birds—little is known about the consumption/dispersal of *I. asarifolia* by animals). Dumping of imported packing material or horticultural material ("yard trash and white goods") was also a common practice in the area. The species is not known in cultivation in the United States, but is cultivated for ornament in Brazil, as "salsa" or "salsa-brava" (Lorenzi & Moreira de Souza 1999). Yet another possibility is introduction for use in traditional herbal remedies (Austin, unpubl. data).

Although *I. asarifolia* may not be New World in origin, it is found widely in Tropical America, from the Carribean to Paraguay (Adams 1972; Austin 1975, 1982a-c, 1997, 1998a-b; Austin & Cavalcante 1982; Austin & Huaman 1996; Austin & Staples 1981; Leon & Alain 1974; McDonald 1994). It is also known in Africa (Heine 1963; Rendle 1905), and in Asia, from Bali,

East Java, India, and West Pakistan (Austin & Ghazanfar 1979; Matthew 1995; Ooststroom 1953).

Documented habitats for this perennial species are largely wet sites—marshes, swamps, roadside ditches, and in wet-cultivated crops such as rice (Austin 1982a). While little has been reported in the literature about *I. asarifolia* as a pest plant across its range, it is a recognized agricultural weed in Venezuela and Brazil (Austin 1982c, 1998a; Kissman & Groth 1992; Lorenzi 1991; Moacyr et al. 1995). The plant is sensitive to frost, but grows in a wide range of moist soils and is easily propagated by stem fragments or seeds (Lorenzi & Moreira de Souza 1999). It apparently produces viable seed in Florida; a few seedlings were observed at the Miramar site, along with extensive mats of vines freely rooting at the nodes. Those vines seen in 1999 on drier ground and mixed with other herbaceous vegetation [e.g., *Setaria parviflora* (Poir.) Kerguélen, *Eupatorium capillifolium* (Lam.) Small] often had leaves noticeably damaged by insects, while vines growing on more open, saturated ground showed no damage. A 1996 sample of unrooted vine was floated in a vat of well water in a quarantine greenhouse (Tallahassee, Florida); it sprouted roots at the nodes and sustained itself under those conditions for several months, until it was moved to a frequently watered pot of soil, where it still grows.

The species has been placed taxonomically in the same section of *Ipomoea* [subg. *Eriospermum* (Hall f.) Verdc. ex D.F. Austin sect. *Erpipomoea* Choisy] as *I. aquatica* and *I. pes-caprae* (L.) R. Br., species similarly known for their proclivity to spread vegetatively by long, adventitiously rooting, runners. *I. asarifolia* resembles *I. pes-caprae* in habit, flower color, and general leaf form; however, the former is a species of freshwater habitats whereas the latter is confined to saline conditions near seacoasts. Also, *I. asarifolia* never has the emarginate to bilobed leaf apex characteristic of *I. pes-caprae*.

Diagnostic characters for identifying *I. asarifolia* in the field include its habit of horizontal stems and alternate, smooth, dark-green, cordate leaves, these often with purplish venation and with tips obtuse to mucronulate. The stems, whether clambering or horizontal, may have small, sparse, fleshy trichomes. The plant's showy morning-glory flowers have a campanulate to funnelform corolla of deep rose-lavender with a purple throat (Fig. 1).

Given the spreading habit of this species, its apparent preference for wetlands, its adaptability to disturbance, its recognition as a weed in some locales, and our experience with the Florida population, we view this introduction with alarm and will continue to monitor its occurrence. Steps are immediately being taken to confine any excavated fill to the current site and to plan a control effort.

We gratefully acknowledge John Tobe for noticing the suspect morning

FIG. 1. *Ipomoea asarifolia* in Florida. Top: Flower, leaf form; Bottom: Creeping habit over water, bare ground, other plants.

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